

## 2.4 WRITING EQUATIONS OF PERPENDICULAR & PARALLEL LINES

RECALL:

Two lines are parallel if they have the same slope.

Two lines are perpendicular if the product of their slopes = -1

↳ Flip & change sign

Ex 1 Write an equation of the line that passes through  $(1, -1)$  & is perpendicular to the line  $y = -\frac{1}{2}x + 6$ .

↳ So  $m = 2$

$$y - y_1 = m(x - x_1) \Rightarrow \text{POINT-SLOPE FORM}$$

$$y - (-1) = 2(x - 1)$$

$$y + 1 = 2x - 2$$

$$\begin{array}{r|l} -1 & -1 \end{array}$$

$$\boxed{y = 2x - 3}$$

Ex 2 Write an equation of the line that passes through  $(3, 2)$  & is parallel to the line  $y = -3x + 2$ .

↳ So  $m = -3$

$$y - 2 = -3(x - 3)$$

$$y - 2 = -3x + 9$$

$$\begin{array}{r|l} +2 & +2 \end{array}$$

$$\boxed{y = -3x + 11}$$

### 3.4 FIND AND USE SLOPES OF LINES

#### POSTULATES

SLOPES OF PARALLEL LINES : In a coordinate plane, two nonvertical lines are parallel iff they have the same slope.

- Any two vertical lines are parallel. •

SLOPES OF PERPENDICULAR LINES : In a coordinate plane, two nonvertical lines are perpendicular iff the product of their slopes is  $-1$ .

- Horizontal lines are perpendicular to vertical lines. •